

LINE (Q 3, PAPER 2)

2006

3 (a) Show that the line containing the points $(3, -6)$ and $(-7, 12)$ is perpendicular to the line $5x - 9y + 6 = 0$.

3 (b) The line K has positive slope and passes through the point $p(2, -9)$. K intersects the x -axis at q and the y -axis at r and $|pq|:|pr| = 3:1$. Find the co-ordinates of q and the co-ordinates of r .

3 (c) (i) Prove that the measure of one of the angles between two lines with slopes m_1 and m_2 is given by

$$\tan \theta = \frac{m_1 - m_2}{1 + m_1 m_2}.$$

(ii) L is the line $y = 4x$ and K is the line $x = 4y$. f is the transformation $(x, y) \rightarrow (x', y')$, where $x' = 2x - y$ and $y' = x + 3y$. Find the measure of the acute angle between $f(L)$ and $f(K)$, correct to the nearest degree.

ANSWERS

3 (b) $q(8, 0)$, $r(0, -12)$

3 (c) (ii) 54°